

Human metapneumovirus in bronchoalveolar lavage fluid samples from haematology patients detected by reverse transcriptase polymerase chain reaction

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Introduction

Human metapneumovirus (hMPV):

- Paramyxovirus
- Respiratory tract infection
- Symptoms comparable to respiratory syncytial virus (RSV)
- Infection described in infants¹, the elderly² and immunocompromised patients^{2,3}
- Bronchoalveolar lavage fluid (BALF) analysis useful in diagnosis pulmonary diseases

Aim

Investigate potential role of hMPV in pulmonary infections in patients with a haematological malignancy by means of reverse transcriptase polymerase chain reaction (RT-PCR) in BALF.

Materials and Methods

Patient inclusion

- April 1999 - June 2006
- University Hospital Maastricht
- Intensive Care Unit and Haematology-oncology ward
- Patients with a haematological malignancy suspected of a pulmonary infection

Exclusion criteria

- < 20 ml recovered volume
- < 60.000 cells/ml
- > 1% Squamous epithelial cells
- > 5% Bronchial epithelial cells
- Excessive amount of debris

BALF work-up

- Total and differential cell count
- Grocott (yeast, fungi, *P. jiroveci*)
- Ziehl Neelsen (Mycobacteria)
- Quantitative bacterial culture
- Culture yeasts/fungi
- Mycobacterial culture

RT-PCR

- Samples retrieved from -80°C
- Target: Nucleoprotein gene
- RNA isolation: MagNA Pure LC Total Nucleic Acid Isolation Kit
- Primers and probes as described by Dare et al.⁴

Results

Samples included

- A total of 117 samples from 95 patients included

Cytological data

- Total cell count and differential cell count: no significant difference between groups

Additional data

- In one patient (case 4) 4 BALF samples within one month: the first 3 BALF were hMPV PCR +, the final BALF (collected 1 month after the first) was hMPV PCR -
- 7/117 (6%) of samples were hMPV PCR +

Figure 1. Included samples. *Number of patients between brackets, HW = Haematology-oncology ward, ICU = Intensive care.

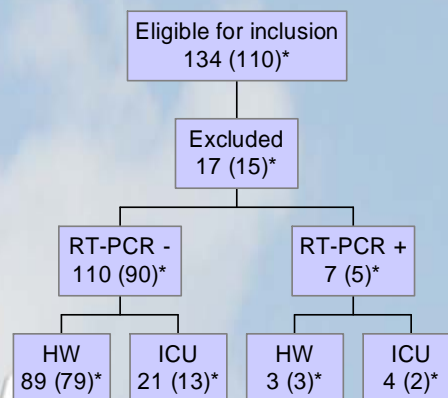


Table 1. Characteristics of the RT-PCR + patients

Variable	Case 1	Case 2	Case 3	Case 4	Case 5
Age, years	58	65	59	51	64
Gender	M	M	M	M	F
Underlying disease	Multiple myeloma	Diffuse large B cell NHL	AML	Multiple myeloma	Mantle cell NHL
Stem-cell	No	No	No	No	Yes
Ct value	29.03	29.03	26.25	27.01	22.57
Co-pathogen	<i>S.pneumoniae</i>	HSV-1	none	none	none
ICU	No	No	No	Yes	Yes
Outcome	Survived	Survived	Survived	Survived	Survived

Discussion

- hMPV previously described as cause pneumonia in immunocompromised patients³
- hMPV described as cause of upper respiratory illness in up to 15%^{5,6}
- Co-infection with other viruses up to 15%⁷
- Infection in ICU-patients (with no haematological malignancy) more common than previously thought?

Conclusion

- 6% of BALF samples from patients in our study population were hMPV RT-PCR +
- hMPV could be considered as a causative agent of pulmonary infections in patients with a haematological malignancy

Reference

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